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IX. *Experiments on a new Colouring Substance from the Island of Amsterdam in the South Sea. Made by Mr. Peter Woulfe, F. R. S. at the Desire of Sir John Pringle, Bart. P. R. S.*

Redde, Feb. 2, 1775. **T**HIS substance is of a light bright orange colour; has a peculiar, though not a strong, smell; and, when handled, gives a yellow stain to the skin, which does not readily wash out with soap and water. Put on a red hot iron, it smoaks, melts, and catches fire, leaving a *caput mortuum*. When boiled with water, it gives the liquor only a slight yellow tinge, which is but little heightened by the addition of a fixed alkaly; therefore the colouring part of this substance is insoluble in water. Oil of vitriol put to it becomes of a red orange colour; but, when the acid is drained off, the *residuum* appears purple. Annatto, treated in the same manner, gives a blue colour. Spirit of wine, æther, fixed and volatile alcalies, as also soap, dissolve the colouring part of this substance. To determine the quantity of colouring matter which it contains, two drams were digested in a mattrafs, with four ounces of rectified spirit of wine; the solution being filtered assumed a rich deep yellow colour, like a strong solution of saffron or gumbouge with the same spirit; what re-

mained in the filter was digested a second time, with four ounces of fresh spirit of wine, and the liquor filtered; this solution was much weaker than the first. The undissolved part remaining in the filter after this second solution was digested, a third time, with four ounces of fresh spirit; but the solution was now quite weak, and of a very pale yellow colour. The *residuum* being now deprived of its colouring portion, was slowly dried, when it appeared of a very pale yellow colour, felt as soft as starch between the fingers, and weighed forty two grains; so that two thirds nearly of this colouring substance are soluble in spirit of wine; the undissolved part is not soluble in water, acids or alkalies. Put on a red hot iron, it smoaks and catches fire without melting, leaving a *caput mortuum*, and gives a smell similar to that arising from common vegetable matter. The first solution in spirit of wine, after standing twenty-four hours, deposits some of its colour in the form of minute spiculine crystals, of an orange colour. The second and third solutions let fall none of their colour. The first solution, dropped on paper, tinges it of a bright orange colour, the second gives a lively yellow colour, and the third a pale yellow. The first solution, sufficiently diluted with spirit of wine, makes a bright yellow stain on paper, no way inclining to an orange, but exactly resembling that made by the second solution; hence it seems probable, that an orange colour is only a deep yellow. Vitriolic æther readily dissolves the colouring part of this substance, and affords solutions of nearly the same colour as those made with

spirit of wine. Oil of turpentine dissolves but a small portion of it, and acquires only a pale yellow colour. A solution of fixed alkaly in water, digested with this substance, dissolves a large portion of its colouring part, and the solution is of a brownish yellow colour. Volatile spirit of *sal ammoniac*. seems to dissolve a larger portion of it than the fixed alkaly, and the solution is of a reddish orange colour. A solution of soap in water, boiled with this substance; likewise dissolves its colouring part. All the foregoing solutions, except that in oil of turpentine, which was not tried, die silk, cloth, and linen, of various shades of yellow and orange; but these colours are discharged, by boiling the dyed substances for some time in soap and water. This colour can, therefore, be of use only in dying silk and wool, for which purpose we are already furnished with good dyes. Few colours go so far in dying as this new substance, and none dye so speedily, especially when soap and water are used as the solvent; for a dip or two will dye cloth or silk of a lively yellow colour, when put into the mixture whilst hot. Soap and water may be perhaps used with advantage, as the solvent for several other colours.

From the foregoing experiments it appears, that this colouring substance, upon which they have been made, is of the resinous kind, and has a good deal of affinity with *annotta*.